

PATENT APPLICATION
IN THE UNITED STATES PATENT AND TRADEMARK OFFICE

In re application of

Docket No: Q62454

Mitsuhiro KANADA, et al.

Appln. No.: 09/750,125

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For: MICROPOROUS SOUNDPROOFING MATERIAL

SUPPLEMENTAL DECLARATION UNDER 37 C.F.R. § 1.132

Mail Stop Amendment
Commissioner for Patents
P.O. Box 1450
Alexandria, VA 22313-1450

Sir:

I, Takayuki Yamamoto, hereby declare and state:

THAT I am a citizen of JAPAN;

THAT I have graduated with a Master's degree in Engineering from Shizuoka University,
Department of Industrial Chemistry in March 1984;

THAT I have been employed by Nitto Denko Corporation since April 1984, where I hold
a position as Chief Researcher in Production Engineering Development Center of the Company;

THAT I am a co-inventor of the invention described and claimed in the above-identified
application;

THAT I am familiar with the prosecution of the above-identified application; and

THAT the experimentation set forth below was conducted by me or under my direct
supervision.

I hereby submit the following additional comparative experimental data (Experiment 7), showing the advantageous effects of the present invention. In Experiment 7 (Comparison), a mixture of hydrated metal oxides is employed. Based on a comparison of the experimental results from Experiment 7 and inventive Examples 7, 8 and 9 it can be seen that the claimed hydrated composite metal hydroxide exhibits unexpectedly superior effects.

Experiment 7

50 parts by weight of polypropylene having a density of 0.9 g/cm³ and a 230°C melt flow rate of 4, 50 parts by weight of an ethylene/propylene elastomer having a JIS-A hardness of 69, 50 parts by weight of 6MgO·H₂O (average particle diameter: 0.1 μm) and 50 parts by weight of ZnO (average particle diameter: 0.5 μm) were kneaded by means of a kneading machine equipped with roller type blades (trade name "Labo Plastmill" manufactured by Toyo Setsu-Syo, Ltd.) at a temperature of 180°C. Subsequently, the resulting mixture was formed into a sheet having a thickness of 0.5 mm and a diameter of 80 mm with a hot platen press heated at 180°C.

This sheet was placed in a pressure vessel and held in a 150°C carbon dioxide gas atmosphere for 10 minutes at an elevated pressure of 15 mPa to thereby impregnate the sheet with carbon dioxide. After 10 minutes, the pressure was abruptly lowered to obtain an expanded material consisting of the olefin polymers. This expanded material had a degree of expansion of 1.5 times.

Evaluation

Flame retardancy of the expanded materials obtained in Experiment 7 above was evaluated in the same method as described on page 32 of the specification of the present invention.

The degree of expansion was determined by the following equation.

Degree of expansion = (density of sheet before expansion) / (density of expanded material) = 1 / (relative density)

The results obtained in Experiment 7 above are shown in the Table below together with the results obtained in Experiments 1 to 6 in the Declaration previously filed on August 23, 2005 and also the results obtained in Examples 7, 8 and 9 of the present application.

Table

	Metal hydroxide (Average particle diameter)	Flame retardancy	Degree of expansion (Times)
Experiment 1	Al_2O_3 (0.6 μm)	Unacceptable	1.4
Experiment 2	Al_2O_3 (8.0 μm)	Unacceptable	2.2
Experiment 3	Al_2O_3 (25.0 μm)	Unacceptable	6.0
Experiment 4	$\text{MgO} \cdot \text{NiO} \cdot \text{H}_2\text{O}$ (0.7 μm)	Acceptable	33
Experiment 5	$6\text{MgO} \cdot \text{Al}_2\text{O}_3 \cdot \text{H}_2\text{O}$ (0.5 μm)	Unacceptable	5.6
Experiment 6	$3\text{MgCO}_3 \cdot \text{Mg}(\text{OH})_2 \cdot 3\text{H}_2\text{O}$ (6 μm)	Unacceptable	1.2
Experiment 7	$\text{MgO} \cdot \text{H}_2\text{O}$ (0.1 μm) + ZnO (0.5 μm)	Unacceptable	1.5
Example 7	$\text{MgO} \cdot \text{ZnO} \cdot \text{H}_2\text{O}$ (1.0 μm)	Acceptable	25
Example 8	$\text{MgO} \cdot \text{ZnO} \cdot \text{H}_2\text{O}$ (1.0 μm) + α	Acceptable	13
Example 9	$\text{MgO} \cdot \text{ZnO} \cdot \text{H}_2\text{O}$ (0.5 μm)	Acceptable	19

α : Ethylenebis(pentabromodiphenyl)
Experiments 1-3 and 5-7: Comparison
Experiment 4: Invention

As shown in the comparison between Example 9 and Experiment 7 (Comparison), it is not possible to obtain a sufficient degree of expansion when a mixture of metal hydroxide is employed, while it is possible to obtain a sufficient degree of expansion when the composite metal hydroxide is employed.

Explanations regarding structural differences between mixture of hydrated metal oxides and composite metal hydrate

In the mixture of hydrated metal oxides, respective hydrated metal oxides are merely mixed and they are each independently present. On the other hand, in the composite metal

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hydrate, metal hydrates react with each other by mixing and subsequent calcinations (firing) thereof, whereby the metal hydrates become unified in stable conditions and are present as a single compound. Accordingly, they are different from each other.

I declare further that all statements made herein of my own knowledge are true and that all statements made on information and belief are believed to be true; and further that these statements were made with the knowledge that willful false statements and the like so made are punishable by fine or imprisonment, or both, under Section 1001 of Title 18 of the United States Code, and that such willful false statements may jeopardize the validity of the application or any patent issuing thereon.

Date: Jan. 25, 2007

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